

Competency practice
for worksheet
(Review Package #2)

Questions 1-4

① $30 + 5 \cdot 14 - (-2)$

$30 + 70 + 2$

$\boxed{102}$ (D)

② $[6 + (-5)^2 + (6)(7)] \div [6(7-4)]$

$[6 + 25 + 42] \div [6(3)]$

$[73] \div [18]$ $\boxed{\frac{73}{18}}$ (D)

③ $6(-9) + |2-18|$

$-54 + |-16|$

$-54 + 16$

$\boxed{-38}$ (D)

④ $-2(4x+1) - (3x+5) - 4x + 6$

$-8x - 2 - 3x - 5 - 4x + 6$

$\boxed{-15x - 1}$ (C)

Questions 5-8

① Evaluate

$x^3 + y - 5$

$x = -3$

$y = -10$

$(-3)^3 + (-10) - 5$

$-27 - 10 - 5$

$\boxed{-42}$ (B)

② $3(2z-2) = 5(z+3)$

$6z - 6 =$

$5z + 15$

$6z - 5z = 15 + 6$

$\boxed{z = 21}$ (D)

③
mult by
lcd
4

$\frac{7}{2}x + 9 = \frac{1}{4}$

$4(\frac{7}{2}x) + 4(9) = 4(\frac{1}{4})$

$2(7x) + 36 = 1$

$14x + 36 = 1$

$14x = 1 - 36 = -35$

$x = \frac{-35}{14} = \boxed{\frac{-5}{2}}$ (D)

④ $8x - 7y = 5$ solve for y

(C) $-7y = 5 - 8x$
 $y = \frac{5 - 8x}{-7} = \boxed{\frac{8x - 5}{7}}$

Questions 9-11

page 2

① $X = \text{the } \#$

$$3x = 2x - 14$$

$$3x + 14 = 2x$$

(A)

set your guide!

⑥ $\frac{\text{widgets}}{\text{defectives}}$

$$\frac{74}{3} = \frac{592}{x}$$

check the
cross
products.

same
as

$$\frac{x}{3} = \frac{592}{74}$$

same
as

$$\frac{3}{x} = \frac{74}{592}$$

(A)

② shortest $X - 101$
middle $x - 52$
tallest x

Height Bldg + Height Bldg + Height Bldg = 603
(short) (middle) (tall)

$$(x - 101) + (x - 52) + x = 603$$

$$3x - 153 = 603$$

$$3x = 756$$

(B)

$$x = 252 \text{ ft} = \text{tallest}$$

③ x
 $x + 1$

$$3(x) + 4(x + 1) = 67$$

$$3x + 4x + 4 = 67$$

$$7x + 4 = 67$$

$$7x = 63$$

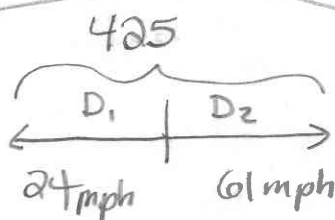
$$x = 9$$

$$\text{smaller} = x = 9$$

$$\text{larger} = x + 1 = 10$$

(A)

④



$$D = RT \text{ (same time)}$$

$$D_1 + D_2 = 425$$

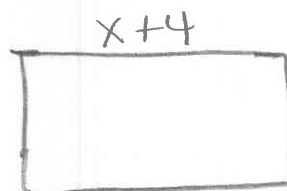
$$24t + 61t = 425$$

$$85t = 425$$

$$t = 5 \text{ hrs}$$

(C)

⑤



$$l = x + 4$$

$$w = x$$

$$P = 124 \text{ m}$$

$$P = 2(x + 4) + 2(x) = 124$$

$$2x + 8 + 2x = 124$$

$$4x = 124 - 8$$

$$4x = 116$$

$$x = 29$$

$$l = 29 + 4$$

$$= 33 \text{ m}$$

(D)

Questions 12-15

page 3

$$\textcircled{1} \left(\frac{x^3 y}{z^4} \right)^4 = \boxed{\frac{x^{12} y^4}{z^{16}}} \textcircled{A}$$

$$\textcircled{2} \frac{(9z^3)^{-2} (9z^{-6})^2}{(9z^{-3})^2}$$

$$= \frac{9^{-2} z^{-6} \cancel{9^2} z^{-12}}{\cancel{9^2} z^{-6}} \textcircled{A}$$

$$= \frac{z^6}{9^2 z^6 z^{12}} = \frac{z^6}{81 z^{18}} = \boxed{\frac{1}{81 z^{12}}}$$

$$\textcircled{3} \frac{(8x^2)^0}{(x^4)^5} = \boxed{\frac{1}{x^{20}}} \textcircled{A}$$

$$\textcircled{4} 0.00004776 = \boxed{4.776 \times 10^{-5}} \textcircled{C}$$

$$\textcircled{5} 4.37 \times 10^6$$

$$4.37 \xrightarrow{6 \text{ places}} = \boxed{4,370,000} \textcircled{C}$$

① Subtract:

$$(2x^4 + 2x^3 - 7x^2 + 8) - (6x^4 + 7x^3 + 2x^2 - 4)$$

$$2x^4 + 2x^3 - 7x^2 + 8 - 6x^4 - 7x^3 - 2x^2 + 4$$

(combine like terms)

$$2x^4 - 6x^4 + 2x^3 - 7x^3 - 7x^2 - 2x^2 + 8 + 4$$

$$\boxed{-4x^4 - 5x^3 - 9x^2 + 12} \quad \textcircled{D}$$

$$\textcircled{2} \quad -6a^3x^7(-7a^6x^6 + 7x^5 + 7a) \quad \textcircled{A}$$

$$42a^9x^{13} - 42a^3x^{12} - 42a^4x^7$$

$$\textcircled{3} \quad (x - 3y)(x - 4y) = x^2 - 4xy - 3xy + 12y^2$$

$$= \boxed{x^2 - 7xy + 12y^2}$$

$$\textcircled{4} \quad 72x^9y^8 - 64x^6y^5 - 40x^2y^2$$

$$\boxed{8x^2y^2(9x^7y^6 - 8x^4y^3 - 5)}$$

$\textcircled{B}$

$$\begin{array}{r} 12 \overline{) 72} \\ 2 \overline{) 36} \\ 2 \overline{) 18} \\ 3 \overline{) 9} \\ 3 \end{array} \quad \begin{array}{r} 8 \overline{) 64} \\ 2 \overline{) 32} \\ 2 \overline{) 16} \\ 2 \overline{) 8} \\ 2 \overline{) 4} \\ 2 \end{array} \quad \begin{array}{r} 5 \overline{) 40} \\ 2 \overline{) 20} \\ 2 \overline{) 10} \\ 5 \end{array}$$

gcf = 8

$$\textcircled{5} \quad 81x^2 - 64 \quad \text{difference of perfect squares}$$

$$\boxed{(9x + 8)(9x - 8)}$$

$\textcircled{A}$

① $6x^4 - 4x^2 + 15x^2 - 10$

(grouping)

$$2x^2(3x^2 - 2) + 5(3x^2 - 2)$$

$$(3x^2 - 2)(2x^2 + 5)$$

② $4x^2 + 8x + 3$

$(2x+1)(2x+3)$ (A)

③ $\frac{y^2 - 3y - 18}{y^2 + 2y - 48} = \frac{(y-6)(y+3)}{(y+8)(y-6)} = \frac{(y+3)}{(y+8)}$ (D)

④ $x^2 + 6x - 40 = 0$

$(x+10)(x-4) = 0$ (A)

$x+10=0$ $x-4=0$

$x=-10$ $x=4$

⑤ $9y^2 + 21y + 10 = 0$

$9y^2 + 15y + 6y + 10 = 0$

$3y(3y+5) + 2(3y+5) = 0$

$(3y+5)(3y+2) = 0$

$3y+5=0$ $3y+2=0$

$3y = -5$ $3y = -2$
 $y = \left(-\frac{5}{3}\right)$ $y = \left(-\frac{2}{3}\right)$

(A)

$ac = 90$

+		
90	1	91
45	2	47
30	3	33
18	5	23
15	6	21

① $\sqrt{8x^3y^5z^{16}}$

groups of 2!



Recall: you can divide 2 into each exponent

$2xy^2z^8 \sqrt{2xy}$

A

② $\sqrt{3}(\sqrt{12} - \sqrt{3})$

$\sqrt{3 \cdot 12} - \sqrt{3 \cdot 3}$

$\sqrt{\underbrace{3 \cdot 3}_{12} \cdot 2} - \sqrt{3 \cdot 3}$

$3 \cdot 2 - 3$

$6 - 3 = 3$

C

③ $-21r + 18 \leq -3(6r - 9)$

$-21r + 18 \leq -18r + 27$

$-21r + 18r \leq +27 - 18$

$-3r \leq 9$

$r \geq -3$

A

$r \geq \frac{15}{12}$

① $x + y = 4$

Find x intercept (let $y=0$)

$$x + 0 = 4$$

$$x = 4$$

so

$$(4, 0)$$

Ⓒ

② $-2x + 5y = 10$

Find y -intercept (let $x=0$)

$$-2(0) + 5y = 10$$

$$5y = 10$$

$$y = 2$$

so

$$(0, 2)$$

Ⓑ

③ choose correct graph
(match intercepts)

$$y = -2x + 1$$

x	y
0	1
$\frac{1}{2}$	0

$$0 = -2x + 1$$

$$-1 = -2x$$

$$+\frac{1}{2} = x$$

Ⓒ

also

$$m = -2$$

so it will have a
downward slope

